APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,103	12/21/2001	Sooyeul Lee	51876P282	3372

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EXAMINER
MACKOWEY, ANTHONY M

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/029,103	LEE ET AL.
	Examiner	Art Unit	
	Anthony Mackowey	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _15 April 2005_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-13_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-5,12 and 13_ is/are rejected.

7)☒ Claim(s) _6-11_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _21 December 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _1/31/2005_.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Response to Arguments

The amendment filed April 15, 2005 has been entered and made of record.

Applicant's arguments filed April 15, 2005 have been fully considered but they are not persuasive.

On page 5, lines 10 - page 6, line 13 applicant traverses the rejection of claims 1, 2, and 12 under 35 U.S.C. 102(b) as being anticipated by Yoshida. On page 5, line 25, applicant recites, "the above recited excerpt from Yoshida does not teach or suggest the calculation of an index of the bone mineral density." The examiner respectfully disagrees. Yoshida teaches the pattern of the soft tissues is subtracted from the approximated pattern of the quantity of transmitted radiation to obtain a corrected pattern of the quantity of transmitted radiation transmitted through the proper (col. 24, lines 37). The examiner has interpreted this quantity of transmitted radiation as the index of bone mineral density because the quantity of transmitted radiation through the bone is directly related to the bone mineral density and is used in calculating the bone mineral density. On page 6, applicant directs examiner's attention to claim 7, wherein the applicant teaches how the index is calculated and further suggests that because the examiner has indicated claim 7 as having allowable subject matter, claims 1 and 12 are allowable. Examiner wishes to point out that claim 7 depends from claim 1. Claim 7 contains all the limitations of claim 1 plus the additional limitations presented in claim 7; claim 1 does not contain all the limitations of claim 7. It is because of the additional limitations presented in claim 7; examiner indicated allowable subject matter.

With regard to arguments presented for the rejections of claims 2-5 and 13 and objections

to claims 6-11, arguments are based on those presented for claims 1 and 12, specifically that

Yoshida does not calculate an index of bone mineral density. The examiner has addressed claims

1 and 12 above and believes Yoshida does calculate an index of bone mineral density at least as

presented in claims 1 and 12. Therefore the rejections and objections stand.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S.

Patent 5,602,935 to Yoshida et al. (Yoshida).

As to claim 1, Yoshida discloses a method for measuring a bone mineral density, by use

of an x-ray image, in a bone mineral density system (col. 3, lines 45-51, Yoshida teaches a

method capable of accurately measuring a sample bone even if the bone has a complicated BMD

(bone mineral density) pattern as well as an apparatus for carrying out the method) comprising

the steps of:

(a)   obtaining an x-ray image of bone (col. 16, lines 34-47, Yoshida teaches the x-ray

information is recorded on an imaging plate, irradiated with a laser, detected by an optical

detector and subjected to A/D conversion to obtain an x-ray image),

(b)   setting a region of interest on the obtained x-ray image of bone (col. 16, lines 59-65, Yoshida determines a region of interest in an input image by a predetermined method),

(c)   calculating a background trend due to soft tissues, at a bone portion within the set region of interest (col. 24, lines 31-33, Yoshida teaches the pattern of the soft tissues is approximated by the line interconnecting the two boundary points is used for correcting the influence of the soft tissue. This influence of soft tissue is understood to be the background trend); and

(d)   calculating an index of the bone mineral density by removing the background trend due to the soft tissues, at the bone portion within the set region of interest (col. 24, lines 33-37, 50-52, Yoshida teaches the pattern of the soft tissue pattern is subtracted to obtain a corrected pattern for the bone proper and that bone mineral density is determined using the corrected pattern).

As to claim 2, Yoshida discloses all the limitations of the method recited in claim 1 and wherein the region of interest, containing the soft tissue portions at a left and right of the bone portion, is set in the obtained x-ray image of bone (Figs. 25 and 26, The graphs are clearly labeled indicating soft tissues to the left and right of the bone positions).

As to claim 12, Yoshida further discloses a computer readable recording medium storing instructions to implement a method for measuring bone mineral density (col. 14, lines 42-44, Yoshida teaches a computer means comprising a ROM storing processing programs, and a RAM for arithmetic operation and temporary data storage.). As to the remainder of the claim, arguments analogous to those presented in claim 1 above are applicable to claim 12.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the

combination of U.S. Patent 5,602,935 to Yoshida et al. (Yoshida) and U.S. Patent 6,671,394 to

Sako.

As to claim 3, Yoshida discloses all the limitations of the method recited in claim 1 and

further includes the steps of:

(c1)   selecting a fitting function to calculate the background trend of the bone portion

(col. 24, lines 31-45, Yoshida teaches a curved or straight line interconnecting the two boundary

points between the soft tissue and bone selected based on the distribution of the thickness of soft

tissue.), and

(c2)   setting the background trend by interpolating the profiles of the soft tissue

portions adjacent to the bone portion into the bone portion by the selected fitting function (col.

24, lines 31-33, Fig. 28B, Yoshida teaches the line connects the boundary points, thus the profile

of the soft tissue is interpolated into the bone portion. This can be seen clearly as being

represented by the labeled "curved line" Fig. 28B.).

Yoshida discloses photoelectric information read from the imaging plate is subjected to

A/D conversion to obtain an x-ray image of the bone and the image is processed for bone

measurement (col. 16, lines 43-47), however, Yoshida is silent with regard to the soft tissue

being presented in gray-level profiles. Sako discloses a method in which an x-ray image

undergoes gradation gray scale conversion processing (col. 16, lines 62-63; col. 13, line 64 – col.

14, line 2, The gradation process adjusts the gray scale values of the image in order for the image

to resemble an x-ray film image.).

The teachings of Yoshida and Sako are combinable because they are in the same field of

endeavor, processing of x-ray information in the form of digital x-ray images. It would have

been obvious to one of ordinary skill in the art at the time the invention was made to combine the

teachings of Yoshida and Sako, having the method taught by Yoshida be performed on gray-

level images as taught by Sako. One skilled in the art would have been motivated to do so

because a gray-level image's gradation characteristics are similar to the x-ray film (silver salt

film) generally used to view x-ray images. Doctors have been well trained in diagnosing patients

using this visualization technique and thus the doctors would be able to apply the same

techniques to the digital images without the need to output the x-ray image to film or develop

new diagnostic techniques (Sako, col. 13, lines 33-54).

As to claim 4, the combination of Yoshida and Sako discloses all the limitations of the

method as recited in claim 3, Yoshida further includes the steps of:

(c2-b) dividing the obtained profile into the bone portion and the soft tissue portions

(col. 24, lines 16-3, The boundary points selected by Yoshida divide the image into bone and soft

tissue portions.); and

(c2-c) interpolating the profile of the divided soft tissue portions into the bone portion by

the fitting function and setting an interpolation result to the background trend due to the soft

tissues (col. 24, lines 31-45, Fig. 28B, Yoshida teaches a curved or straight line interconnecting

the two boundary points between the soft tissue and bone selected based on the distribution of

the thickness of soft tissue; the line connects the boundary points, thus the profile of the soft

tissue is interpolated into the bone portion. This can be seen clearly as being represented by the

labeled "curved line" Fig. 28B

Yoshida discloses photoelectric information read from the imaging plate is subjected to

A/D conversion to obtain an x-ray image of the bone and the image is processed for bone

measurement (col. 16, lines 43-47), however, Yoshida is silent with regard to obtaining the gray

level profile from the region of interest. Sako discloses a method in which an x-ray image

undergoes gradation gray scale conversion processing (col. 16, lines 62-63; col. 13, line 64 – col.

14, line 2, The gradation process adjusts the gray scale values of the image in order for the image

to resemble an x-ray film image.). Arguments presented in claim 3 with regard to the

combinability of Yoshida and Sako, and motivation for doing so, are applicable to claim 4.

As to claim 5, Yoshida further discloses the fitting function is a polynomial of a 4th order

of less (col. 24, lines 37-41, Yoshida teaches that the line may be straight or curved. For a line to

be curved it must be at least a 2nd order polynomial, thus the teachings of Yoshida would include

lines formed by polynomials of 4th order or less.).

As to claim 13, arguments analogous to those presented in claim 3 above are applicable

to claim 13.

Allowable Subject Matter

Claims 6-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Mackowey whose telephone number is (571) 272-7425. The examiner can normally be reached on M-F 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (571) 272-7414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AM
7/5/2005

JINGGE WU
PRIMARY EXAMINER